The cleared property would be allowed to return to native vegetation, with limited plantings in some areas. Some areas would be graded for ponding/wetlands to occur. Limited ecosystem restoration of a few floodplain areas would be undertaken (e.g., creation of small hardwood wetland areas) in coordination with the MVCD. The previously modified sections of the Mill Creek channel would not be disturbed, except for the creation of riffles about every 500 feet to improve fish habitat and trees planted every 200 feet along both banks. In order to insure an open channel these improved sections would continue to be maintained in the future by the Millcreek Valley Conservancy District. This plan does not attempt to provide for major ecosystem restoration of the entire 25-year floodplain, but neither does it preclude such work by others in the future.

A 10-foot wide asphalt bike trail would be constructed along the channel within the right-of-way in sections 4, 6, and 7. Other recreational complements could be developed where continuous tracts of land would be available.

The Flood Warning System to be installed in July 2003 would be adjusted to account for the warning needs of the RL alternative.

10.2.2 Hydrology & Hydraulics

With the acquisition and removal of the structures, some changes in overbank storage and flow patterns could occur, thereby changing the frequency of flooding. However, it was assumed these changes in storage and flow would be minimal and that use of the WO alternative hydraulics was adequate for the screening of the RL alternative. Refer to Appendix IV for the water surface profiles for the WO alternative.

10.2.3 Environmental

With the RL alternative, the removal of development from the 4% chance floodplain would allow the cleared land to be colonized by native vegetation and undergo successional development, from vacant land to old field vegetation and the scrub/shrub woody species stages until a form of BLH woodland develops with occasional field openings and gaps in the wooded canopy.

Improvements to water quality and the potential for improved aquatic species habitats would be accompanied by an increase in wildlife habitat (multiple ecotypes) that would become available for birds, mammals, amphibians, and reptile species of the area. When the 4% chance floodplain is cleared, the terrestrial habitat would provide substantial travel lanes/corridors and forage/concealment opportunities for a broad spectrum of wildlife species. Additional water quality improvements would result from the reduction of CSOs. CSOs would be addressed by MSD's CSO reduction plan, entitled *Mill Creek CSO Reduction Plan, in Lieu of a Deep Tunnel Parallel to Mill Creek*, (October 2002). It should be noted that a temporary degradation of water quality during the construction phase would likely occur.

The limited ecosystem restoration at the junction of the mainstem and the East Fork Creek would consist of plantings of trees and associated species designed to undergo successional development. Soil erosion and sediments would be reduced as the result of this action. An associated environmental impact would be the improvement in surface water quality through reduction in turbidity, total dissolved solids (TDS), and total suspended solids (TSS) as the result of more extensive vegetation growth and filtering of the surface stormwaters and runoff waters entering into Mill Creek. Riparian vegetation development would improve available wildlife habitat. The planting of trees along the previously completed mainstem would promote reduction of the thermal burden in the surface water of the creek by shading, thus lowering the ambient water temperature and making the aquatic ecosystem more suitable for a wider diversity of species as well as increased individual species populations. Restored planted areas would serve as seed traps by collecting the disseminated seeds of nearby vegetation, thereby promoting regrowth, species diversity, and species competition for the overstory, understory, and shrub/ground cover strata.

In-channel improvements would be undertaken as a component of this alternative. They would include the creation of artificial riffle areas in previously modified sections that would provide flow modification and serve as physical water energy dissipaters under normal flow conditions. At the ends of the riffle areas, pooled areas of re-oxygenated water would provide a more diverse habitat for a wider range of aquatic organisms. The riffle areas and flow diverters would increase the dissolved oxygen and enhance the pool-rifle-glide configuration within the individual sections of Mill Creek, promoting increased numbers and diversity of fish and other aquatic species.

A beneficial effect of the RL alternative would be the removal of facilities from the floodplain that use, handle, or store hazardous substances, and the elimination of their potential to contaminate the creek should a leak or spill occur.

10.2.4 Economics

10.2.4a Cost Analysis

The real estate cost estimate was based on the cost to buy the land and relocate businesses and residences located within the 4% chance floodplain. In accordance with ER 405-1-12, Chapter 5, "Estates", the Estate 1, Fee is required for all real estate acquisition. (These estate types (e.g., Estate 1-- "Fee") refer to categories of real estate compensation, and not to specific parcels). The estimated cost for real estate acquisition is $497 million (Table 10.2.4.1).

TABLE 10.2.4.1
Real Estate Costs for RL Alternative

Component	Acres	Unit Value	Total Value
Fee Simple			
Vacant Land – Industrial	241	$85,000	$20,485,000
Vacant Land – Commercial	23.1	$225,000	$5,198,000
Vacant Land – Residential	63.1	$90,000	$5,679,000
Improved Land – Industrial	963.6		$195,764,000
Improved Land – Commercial	92.6		$13,790,000
Improved Land – Residential	252.4		$18,410,000
Minerals (None)			$0
Timber (None)			$0
Fee Improvements (None)			$0
Easements (None)			$0
Total Land, Improvements, and Damages	1635.8		$259,326,000
Contingency (35%)			$90,764,000
			$350,090,000
TOTAL ESTIMATED LAND COSTS			**$350,100,000**
Relocations (Mandatory Buyout)			$140,000,000
Administration (680 Ownerships)			
Non-Federal Admin ($5,000/ownership)			$3,400,000
TOTAL LERRD			**$493,500,000**
Federal Admin ($5,000/ownership)			$3,400,000
			$496,900,000
TOTAL ESTIMATED REAL ESTATE COST			**$497,000,000**

Notes: price level in 2002 dollars

For cost estimation purposes, the structures to be demolished were divided into categories based on their size and use, and a set of assumptions for the amount of special waste for each structure in each category was developed (e.g., amount of wall board, transite[6], asbestos-insulated pipe, etc.). All demolition material was assumed to be disposed of in local landfills. Quotes were obtained for deposing of the type and quantity of material.

The cost estimate for the RL alternative includes: construction; real estate; construction management; planning, engineering, and design (PED); and mobilization/demobilization. It was assumed that no environmental mitigation cost would be incurred for this alternative, since RL should have a net positive impact to the environment. The cost estimate is $648,265,000 (Table 10.2.4.2).

[6] *Transite* is a mixture of asbestos and cementious materials that could be manufactured into various shapes.

TABLE 10.2.4.2
Cost Estimate for RL Alternative

Feature	Cost
Section 1	$8,000
Section 2	$17,000
Section 3	$15,000
Section 4A	$13,000
Section 4 B	$4,974,000
Section 5	$0
Section 6	$21,095,000
Section 7	$95,248,000
Section 8	$0
Real Estate	$497,000,000
Environmental Mitigation	$0
Construction Management	$6,972,000
PED	$11,952,000
Mobilize/Demobilize	$2,988,000
Utility Conflicts	$7,486,000
Traffic Control	$498,000
TOTAL	**$648,265,000**

Notes: price level in 2002 dollars

Completion of the RL alternative is estimated for 2009, with the alternative base year being 2010. For this analysis, the construction costs were assumed to be uniformly distributed over the construction period. The average annual first cost was calculated by annualizing the first cost and the interest during construction. The alternative's average annual cost was calculated by adding the average annual first cost and the average annual O&M cost. The average annual cost for the 2010 alternative base year is estimated at $44,279,000 (Table 10.2.4.3). See Appendix V for detailed life cycle costs.

TABLE 10.2.4.3
Average Annual Cost for RL Alternative

First Cost	Interest During Construction	Avg Annual First Cost	Avg Annual O&M	Avg Annual Cost (2010)
$648,265,000	$61,163,000	$44,226,000	$53,000	$44,279,000

Notes: discount rate 5.875%; 50-year project life; price level in 2002 dollars

10.2.4b Benefit Analysis

The HEC-FDA program was used to estimate flood damage to structures in the study area, while a separate analysis was used to estimate the damage to basements from sewer back-up. Structure damage reduction would begin prior to the completion of the project because

structures would be removed from the floodplain. For this reason, the benefit calculation took into account the damage reduction for the year prior to the alternative base year. With risk and uncertainty factored in, the average annual damage for the RL alternative is estimated at $13,043,000 (base year 2010). Table 10.2.4.4 displays the damage estimates for selected years.

TABLE 10.2.4.4
Average Damage Estimate for RL Alternative (thousands of dollars)

Year	N[7]	Overbank Flooding	Sewer Back-up	Total
2002		$35,409	$9,400	$44,809
2003		$37,200	$9,400	$46,600
2004		$39,000	$9,400	$48,400
2005		$40,800	$9,400	$50,200
2006		$42,600	$9,400	$52,000
2007		$44,400	$9,400	$53,800
2008		$46,200	$9,400	$55,600
2009		$3,049	$9,400	$12,449
2010	1	$3,163	$9,400	$12,563
2011	2	$3,277	$9,400	$12,677
2012	3	$3,392	$9,400	$12,792
2013	4	$3,506	$9,400	$12,906
2014	5	$3,620	$9,400	$13,020
2015	6	$3,737	$9,400	$13,137
2016	7	$3,737	$9,400	$13,137
2017	8	$3,737	$9,400	$13,137
2018	9	$3,737	$9,400	$13,137
2019	10	$3,737	$9,400	$13,137
2024	15	$3,737	$9,400	$13,137
2029	20	$3,737	$9,400	$13,137
2034	25	$3,737	$9,400	$13,137
2039	30	$3,737	$9,400	$13,137
2044	35	$3,737	$9,400	$13,137
2049	40	$3,737	$9,400	$13,137
2054	45	$3,737	$9,400	$13,137
2059	50	$3,737	$9,400	$13,137
Total		$185,127	$470,000	**$655,127**
Present Value (2010)		$58,598	$151,297	**$209,895**
Avg Annual Damage (2010)		$3,653	$9,432	**$13,043**

Notes: discount rate 5.875%; 50-year project life; price level in 2002 dollars

The total annual benefits of the RL alternative were calculated by taking the damages from the WO alternative and subtracting the damages of the RL alternative, and then adding the O&M costs for the WO alternative that would be avoided. Table 10.2.4.5 displays the total annual benefits for the base year.

[7] "N" equals the number of years after project completion. The base year is the earliest year that benefits would accrue under this alternative.

TABLE 10.2.4.5
Benefit Calculations for RL Alternative

WO Alternative Damage (2010)	RL Alternative Damage (2010)	Avoided O&M Cost	Annual Benefit (2010)
$66,750,000	$13,043,000	$34,000	$53,741,000

Notes: price level in 2002 dollars

10.2.4c Economic Evaluation

The economic feasibility of the RL alternative was determined by comparing the benefits and the costs (Table 10.2.4.6). The RL alternative has a BCR greater than 1.0, indicating that it would be economically justifiable.

TABLE 10.2.4.6
Economic Evaluation of RL Alternative (base year 2010)

Annual Benefit	Annual Cost	BCR	Annual Net Benefit
$53,741,000	$44,279,000	1.21	$9,462,000

Notes: price level in 2002 dollars

10.2.5 Summary

The RL alternative does completely and effectively meet the primary object of providing flood damage reduction. Protection offered by the alternative extends to the 4% chance event. Preliminary estimates indicate that the RL alternative is cost efficient. However, relocation of businesses to other areas possibly outside of the state or county and the significant loss of tax revenue would threaten community, state and local government acceptability of this alternative. The RL alternative would not disturb the channel of Mill Creek and the bank areas would be restored with riparian vegetation. As explained in Section 8.1, all excavated special waste (contaminated waste) would be disposed of in accordance with regulations and in a designated landfill.

The RL alternative does not satisfy all of the four current evaluation criteria of the USACE planning guidelines listed in Section 2.4; namely, the RL fails under the criteria of "acceptability" due to the significant loss of tax base and employment in the study area. It is also not as efficient as the NS plan described below (NS has higher net benefits).

10.3 NON-STRUCTURAL (NS)

10.3.1 Description and Features

The NS alternative is similar to the RL alternative in that it would involve relocating the majority of businesses and residences to areas outside of the 4% chance floodplain. However, the NS alternative would protect and leave in place 25 structures, which collectively account for approximately 80% of all damages in the study area. These 25 structures would be protected with eight new or improved ring-levees or floodwalls. The selected 25 structures are comprised of industrial facilities located in section 7. Maps showing areas of impact for the NS alternative can be found in Appendix VIII.

The selected structures would be protected through the construction of 11,422 lf of levees and 13,118 lf of floodwalls (Table 10.3.1.1). To assure FEMA insurance protection, new and existing ring-levees and floodwalls would be constructed/reinforced to current FEMA standards to the 1% chance flood protection. The floodwalls and levees would include automatic gate closures and interior drainage systems (storm sewers and pump stations). Construction of the NS alternative would begin in 2007 and be completed in 2010.

TABLE 10.3.1.1
Construction Quantities for NS Alternative

Section	Levee (lf)	I-wall (lf)	Road Closures	RR Closures	Bike Trails (lf)	Riffles and Trees
8	0	0	0	0	0	No
1	0	0	0	0	0	Yes
2	0	0	0	0	0	Yes
3	0	0	0	0	0	Yes
4	0	0	0	0	4,445	Yes
5	0	0	0	0	805	No
6	0	0	0	0	10,840	No
7	11,422	13,118	27	15	10,675	No
Total	**11,422**	**13,118**	**27**	**15**	**26,765**	**N/A**

Notes: Quantities are for construction on mainstem and tributaries

For the NS alternative, detailed mapping showing the 4% chance floodplain along the entire length of Mill Creek was used to identify the properties to be acquired (refer to maps in Appendix VI for 4% chance floodplain). The floodplain was based upon existing conditions for this screening-level analysis. The residential and commercial structures not protected (Table 10.3.1.2) would be demolished to ground (grade) level and basements filled. The sites would be backfilled, compacted, graded, and seeded.

10.3.3 Environmental

The NS alternative differs from the previously described RL alternative. In the NS alternative, there would be construction of levees and floodwalls, and retention of access roads to the selected 25 protected structures. Because of this construction, a smaller acreage of habitat within the 4% chance floodplain would be available for the return of the land to riparian habitat types in various successional stages.

The removal of development from the 4% chance floodplain would allow the cleared land to be colonized by native vegetation and undergo successional development, from vacant land to oldfield vegetation and scrub/shrub woody species stages, until finally a form of Bottomland Hardwood (BLH) woodland develops with occasional field openings and gaps in the wooded canopy.

Improvements to water quality and the potential for improved aquatic species habitats would be accompanied by an increase in wildlife habitat (multiple ecotypes) that would become available for birds, mammals, amphibians, and reptile species of the area. When the 4% chance floodplain is cleared, the terrestrial habitat would provide substantial travel lanes/corridors and forage/concealment opportunities for a broad spectrum of wildlife species. Additional water quality improvements would result from the reduction of CSOs. CSOs would be addressed by MSD's CSO reduction plan, entitled *Mill Creek CSO Reduction Plan, in Lieu of a Deep Tunnel Parallel to Mill Creek* (October 2002).

Many of the study area industries use various solvents and other chemicals in their manufacturing processes. Protecting these industrial facilities from flooding may reduce the potential for contamination of floodwaters and subsequent transport of contaminants throughout the floodplain.

The limited ecosystem restoration at the junction of the mainstem and the East Fork Creek would consist of plantings of trees and associated species designed to undergo successional development. Soil erosion and sediments would be reduced as the result of this action. An associated environmental impact would be the improvement in surface water quality through reduction in turbidity, TDS, and total suspended solids (TSS) as the result of more extensive vegetation growth and filtering of the surface stormwaters and runoff waters entering into Mill Creek. Riparian vegetation development would improve available wildlife habitat. The planting of trees along the previously constructed sections of the mainstem would promote reduction of the thermal burden in the surface water of the creek by shading, thus lowering the ambient water temperature and making the aquatic ecosystem more suitable for a wider diversity of species as well as increased individual species populations. Restored planted areas would serve as seed traps by collecting the disseminated seeds of nearby vegetation, thereby promoting regrowth, species diversity, and species competition for the overstory, understory, and shrub/ground cover strata.

In-channel improvements would be undertaken as a component of this alternative. They would include the creation of artificial riffle areas in previously modified sections that would

structure in each category was developed (e.g., amount of transit siding, asbestos-lined pipe, etc). All demolition material was assumed to be disposed of in local landfills. Quotes were obtained for disposing of the type and quantity of material.

The cost estimate for the NS alternative included construction; real estate; environmental mitigation; construction management; planning, engineering, and design (PED); and mobilization/demobilization. The NS alternative cost estimate is $573,486,000 (Table 10.3.4.2).

TABLE 10.3.4.2
Total Cost Estimate for NS Alternative

Feature	Cost
Section 1	$8,000
Section 2	$17,000
Section 3	$15,000
Section 4A	$13,000
Section 4 B	$8,519,000
Section 5	$227,000
Section 6	$45,442,000
Section 7	$175,823,000
Section 8	$0
Real Estate	$296,000,000
Environmental Mitigation	$5,269,000
Construction Management	$12,295,000
PED	$21,077,000
Mobilize/Demobilize	$5,269,000
Utility Conflicts	$2,635,000
Traffic Control	$878,000
TOTAL	**$573,486,000**

Notes: price level in 2002 dollars

Completion of the NS alternative is estimated for 2010, with the alternative's economic base year being 2011. For this analysis, the construction costs were assumed to be uniformly distributed over the construction period. The average annual first cost was calculated by annualizing the first cost and the interest during construction. The alternative's average annual cost was calculated by adding the average annual first cost and the average annual O&M cost. The average annual cost for the 2011 alternative base year is estimated at $40,667,000 (Table 10.3.4.3). For comparison with all the other alternatives, this cost was adjusted to a project base year of 2010 and is estimated at $38,410,000. See Appendix V for detailed life-cycle costs.

TABLE 10.3.4.3
Average Annual Cost for NS Alternative

First Cost	Interest During Construction	Avg Annual First Cost (2011)	Avg Annual O&M	Avg Annual Alternative Cost (2011)	Avg Annual Cost (2010)
$573,486,000	$75,889,000	$40,482,000	$185,000	$40,667,000	$38,410,000

Notes: discount rate 5.875%; 50-year project life; price level in 2002 dollars

adjusted from a alternative base year of 2011 to a project base year of 2010. Table 10.3.4.5 displays the total annual benefits for both the alternative and project base years.

TABLE 10.3.4.5
Benefit Calculations for NS Alternative

WO Alternative Damage (2011)	NS Alternative Damage (2011)	Avoided O&M Cost	Annual Benefit (2011)	Adjusted Annual Benefit (2010)
$67,226,000	$14,424,000	$34,000	$52,836,000	$49,905,000

Notes: discount rate 5.875%; 50-year project life; price level in 2002 dollars

10.3.4c Economic Evaluation

The economic feasibility of the NS alternative was determined by comparing the benefits and the costs (Table 10.3.4.6). The NS alternative has a BCR greater than 1.0, indicating that it would be economically justifiable.

TABLE 10.3.4.6
Economic Evaluation of NS Alternative (base year 2010)

Annual Benefit	Annual Cost	BCR	Annual Net Benefit
$49,905,000	$38,406,000	1.30	$11,495,000

Notes: price level in 2002 dollars

10.3.5 Summary

The NS Alternative, is considered engineeringly feasible, and does effectively and completely meet the primary objective of providing flood damage reduction. Preliminary estimates indicate that the NS alternative is cost efficient The NS alternative would not disturb the existing channel of Mill Creek. As part of the ecosystem restoration, trees would be planted at the tops of the banks every 200 feet in the completed sections (1, 2, 3 and 4A) with riffle structures added to the stream every 500 feet on both sides. Streambed improvements would be made for aquatic habitat. All excavated special waste would be disposed of in accordance with regulations in a designated landfill.

However, the NS alternative may not be acceptable to the Sponsor and to large segments of the community because of the impact on local communities due to the relocation of businesses and residences -- creating a significant cost and revenue loss to their tax base. The alternative may also be unacceptable because of its level-of-protection -- it buys out or protects property only within the 4% (25-year) chance floodplain.

TABLE 10.4.1.2
Demolition Quantities for NS-2 Alternative

Section	Residential Structures	Commercial Structures	Roadway (sy)	Parking (sy)
8	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0
5	0	0	0	0
6	0	0	0	0
7	0	4	0	7,186
Total	**0**	**4**	**0**	**7,186**

Limited ecosystem restoration of a few floodplain areas would be undertaken (e.g., creation of small hardwood wetland areas) in coordination with the MVCD. The previously constructed sections of the Mill Creek channel would not be disturbed, except for the creation of riffles about every 500 feet to improve fish habitat and trees planted along the banks.

10.4.2 Hydrology & Hydraulics

The ring levees and floodwalls included in the NS alternative would result in some marginal loss of overbank storage, thereby changing the frequency and extent of flooding flows. However, it was assumed these changes in storage would be minimal because many of the structures to be protected already have some level of protection. WO alternative hydraulics were considered adequate for the screening of the NS-2 alternative. Refer to Appendix IV for the water surface profiles for the WO alternative.

10.4.3 Environmental

The NS-2 alternative provides limited opportunity for environmental restoration. Levee and floodwall construction around the selected structures would result in the reduction in surficial soils erosion and sediments generation. Many of the study area industries use various solvents and other chemicals in their manufacturing processes. Protecting these industrial facilities from flooding may reduce the potential for contamination of floodwaters and subsequent transport of contaminants throughout the floodplain. Additional water quality improvements would result from the reduction of CSOs. CSOs would be addressed by MSD's CSO reduction plan, entitled *Mill Creek CSO Reduction Plan, in Lieu of a Deep Tunnel Parallel to Mill Creek* (October 2002).

In-channel improvements would be undertaken as a component of this alternative and would ostensibly be identical to those described for the previous NS alternative. In-channel improvements include creation of artificial riffle areas in previously modified sections that provide flow modification and serve as physical water energy dissipaters under normal flow conditions. At the ends of the riffle area, pools of re-oxygenated water would provide a more

The cost estimate for the NS-2 alternative includes construction; real estate; environmental mitigation; construction management; PED; and mobilization/demobilization. The NS-2 alternative cost estimate is $155,132,000 (Table 10.4.4.2).

TABLE 10.4.4.2
Total Cost Estimate for NS-2 Alternative

Feature	Cost
Section 1	$8,000
Section 2	$17,000
Section 3	$15,000
Section 4A	$13,000
Section 4 B	$0
Section 5	$0
Section 6	$0
Section 7	$118,147,000
Section 8	$0
Real Estate	$8,000,000
Environmental Mitigation	$7,233,000
Construction Management	$6,329,000
PED	$10,850,000
Mobilize/Demobilize	$2,712,000
Utility Conflicts	$1,356,000
Traffic Control	$452,000
TOTAL	**$155,132,000**

Notes: price level in 2002 dollars

Completion of the NS-2 alternative was estimated for 2010, with the alternative base year being 2011. For this analysis, the construction costs were assumed to be evenly distributed over the construction period. The average annual first cost was calculated by annualizing the first cost and the interest during construction. The alternative's average annual cost was calculated by adding the average annual first cost and the average annual O&M cost. The average annual first cost for the 2011 alternative base year is estimated at $11,210,000 (Table 10.4.4.3). For comparison, this cost was adjusted to a project base year of 2010 and is estimated at $10,588,000. See Appendix V for detailed life cycle costs.

TABLE 10.4.4.3
Average Annual Cost for NS-2 Alternative

First Cost	Interest During Construction	Avg Annual First Cost (2011)	Avg Annual O&M	Avg Annual Alternative Cost (2011)	Avg Annual Cost (2010)
$155,132,000	$21,805,000	$11,030,000	$180,000	$11,210,000	$10,588,000

Notes: discount rate 5.875%; 50-year project life; price level in 2002 dollars

benefits were adjusted from a alternative base year of 2011 to a project base year of 2010. Table 10.4.4.5 displays the total annual benefits for both the alternative and project base years.

TABLE 10.4.4.5
Benefit Calculations for NS-2 Alternative

WO Alternative Damage (2011)	NS-2 Alternative Damage (2011)	Avoided O&M Cost	Annual Benefit (2011)	Adjusted Annual Benefit (2010)
$67,226,000	$24,486,000	$34,000	$42,740,000	$40,400,000

Notes: discount rate 5.875%; 50-year project life; price level in 2002 dollars

10.4.4c Economic Evaluation

The economic feasibility of the NS-2 alternative was determined by comparing the benefits and the costs (Table 10.4.4.6). The NS-2 alternative has a BCR greater than 1.0, indicating that it would be economically justifiable.

TABLE 10.4.4.6
Economic Evaluation of NS-2 Alternative (base year 2010)

Annual Benefit	Annual Cost	BCR	Annual Net Benefit
$40,400,000	$10,588,000	3.82	$29,812,000

Notes: price level in 2002 dollars

10.4.5 Summary

The NS-2 alternative is complete and does effectively meet the primary object of providing flood damage reduction; however, it would only offer protection to a small percentage of the structures in the floodplain. The utilization of ring levees would be engineeringly feasible. The NS-2 alternative would reduce only those damage costs associated with the 25 structures protected by the ring levees and floodwalls. The remaining structures in the floodplain would be left unprotected. Because only a few businesses would benefit, the NS-2 alternative would not be acceptable to the community. There would be limited environmental improvements associated with this alternative. Those improvements would be realized in enhanced aquatic and terrestrial habitat. Estimates indicate that the NS-2 alternative is cost efficient.

The NS-2 alternative does not satisfy all of the evaluation criteria of the USACE planning guidelines listed in Section 2.4; namely, NS-2 fails under the criteria of "acceptability" since the alternative benefits only a small portion of the community.